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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,744	07/12/2006	**Akira Bandoh**	Q81505	1506

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EXAMINER	
AHMED, SELIM U	

ART UNIT	PAPER NUMBER
2826	

NOTIFICATION DATE	DELIVERY MODE
04/15/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Advisory Action Before the Filing of an Appeal Brief	**Application No.** 10/585,744	**Applicant(s)** BANDOH ET AL.	
	Examiner SELIM AHMED	**Art Unit** 2826	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 29 March 2010 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
   a) ☒ The period for reply expires *3* months from the mailing date of the final rejection.
   b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: _____.
   Claim(s) objected to: _____.
   Claim(s) rejected: *37, 55-66*.
   Claim(s) withdrawn from consideration: *38-54,67 and 68*.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: See note below.
12. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____
13. ☐ Other: _____.

/Sue A. Purvis/
Supervisory Patent Examiner, Art Unit 2826

Applicant's remark filed on 03/29/2010 has been fully considered but found not persuasive. On page 2 of the remark applicant's main argument being, "This rejection should be withdrawn because Kawano and Guo do not disclose or render obvious the present invention, either alone or in combination. ."

Again, as indictaed in the final rejection sent on 11/30/2009, Kawano lacks the repetition number of said higher concentration layer and said lower concentration layer is 10 to 1000 and a thickness of a repetition cycle being 1 nm to 1000 nm. In para[0012, 0039-0042] and claims 5-8 of Kawano discloses one or more repetition of said higher concentration layer and said lower concentration layer. In para[0027] of Kawano discloses a thickness of a repetition cycle is as low as 10 um. So, difference between prior art device and claimed device is that applicant's claimed device having specific 10 to 1000 repetitions of higher concentration and lower concentration layers with a thickness of 1 nm to 1000 nm while Kawano discloses a device with one or more higher concentration and lower concentration layer with a thickness of as low as 10 um. However, in Fig.1, para[0134] of Guo discloses Aluminum nitride and Gallium nitride (i.e. Group III-nitride semiconductor layers as applicant claimed) superlattice repetition layers 20, 22 with 5-15 repetitions of layers 20, 22 with a thickness on the order of 10 nm or less. So, it is reasonable to say that it is within the scope of one ordinary skill in the art to form 10 to 1000 repetitions of Group III-nitride semiconductor layers with a thickness of the repetition cycle within 1 nm to 1000 nm. While Kawano discloses one or more higher concentration and lower concentration layer with a thickness of a repetition cycle being as low as 10 um, Guo discloses the missing claimed feature of 10-1000 repetitions (Guo teaches 5-15 repetitions) and thickness of 1 nm to 1000 nm (Guo teaches 10 nm or less).

Furthermore, in para[0013] of Guo discloses, "...superlattices introduce compressive strain into the gallium nitride-based semiconductor materials in the structure and, hence, prevent cracking of the gallium nitride based semiconductor layers. Further, it is also believed that the superlattices serve as "filters" which limit propagation of crystalline defects such as those referred to as threading dislocation from the lower layers of the structure upwardly into the operative structure at the top. These factors are believed to contribute to the high crystal quality of the gallium nitride-based semiconductors in the operative structure. Further, it is believed that the superlattices tend to limit diffusion of silicon into the gallium nitride-based semiconductors." So, as Guo pointed out, superlattice serve as a "filter" which limits propogation of crystalline defects contributing high crystal quality. The Examiner referred desirable output as high crystal quality. While Kawano's structure lacks specific thickness and repetitions, Guo discloses Aluminum nitride and Gallium nitride superlattice repetition layers 20, 22 with 5-15 repetitions with a thickness on the order of 10 nm or less.So, it reasonable to assume that one would optimize the repetition number and thickness of the superlattice layer i.e. applicant's high and low concentration GaN layers as shown by Guo for high crystal quality. It is well known in the semiconductor fabrication process to optimize certain parameters within a technology using design of experiment (DOE) technique to meet certain product specific performance and reliability. So, it would have been obvious to one of ordinary skill in the art to form the repetition number of 10 to 1000 of said higher concentration layer and said lower concentration layer and a thickness of a repetition cycle within 1 nm to 1000 nm through routine experimentation of the film deposition chemistry and parameters.

Furthermore, Kawano in view Guo discloses ranges that lie within the claimed ranges. In such case, according to MPEP 2144.05-I, a prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a prima facie case of obviousness." In re Peterson, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003). So, in this case, a prima facie case of obviousness is established with Kawano in view of Guo since according to MPEP 2144.05-I, a range can be disclosed in multiple prior art references instead of in a single prior art reference depending on the specific facts of the case. Iron Grip Barbell Co., Inc. v. USA Sports, Inc., 392 F.3d 1317, 1322, 73 USPQ2d 1225, 1228 (Fed. Cir. 2004).

It appears that although preamble of applicant's claim 55 is a process (process for producing Group III-nitride semiconductor layer), the body of the claim does not recite a process step. In another words, claim 55 recites structural limitations rather than process steps in the body of the claim. So, claim 55 recites 2 different statutotry classes. Even for the sake of argument, the claim limitations, "wherein each of said n-type impurity atom higher concentration layer and said n-type impurity atom lower concentration layer is stacked so that, in addition to the concentration of the n-type impurity to be doped, conditions for growth within a reactor are also differentiated" is assumed to be process limitations (although not since there is no specific process step), as indicated in the final rejection, these limitations are disclosed in Kawano. So, applicant's claimed invention is obvious over Kawano in view of Guo.

Thus the Examiner still believes the final rejection sent on 11/30/2009 is proper